

# Osmosis and Diffusion



- **Generally animal cells are adapted to an isotonic environment.** If placed in pure water, the water will move into the cell and the cell will expand until it bursts (cytolysis). The cell membrane is very elastic (like a balloon). Special adaptations allow some animal cells to live in hyper and hypotonic solutions.
- **Plants generally depend on a hypotonic environment for water uptake.** When placed in water, the water will move into the plant cell, but the *cell wall* surrounding the cell membrane is not very expandable. Pressure builds up within the cell from the influx of water. The pressure or force directed against the cell wall is called *turgor pressure*. If you put limp celery or a wilted flower into water, the cells will take up water and become *turgid*.

Water molecules, in the process of osmosis never stop moving. Even when the concentration of solute is equal on both sides (**isotonic**), the water molecules move in and out of a cell at an equal rate. The same number of water molecules move in and out, so the system remains in **equilibrium**.

## Part I: Egg Osmosis

In the lab, we will explore the movement of water into and out of a cell, by using an egg as an osmometer (a meter to measure the process of osmosis). Remember that an egg is a single cell, a very large single cell. Using our egg osmometers, we will measure the effects of hypertonic and hypotonic solutions on animal cells.

Use the information you just read to answer the following questions.

1. If more water moves into an egg than moves out, you would expect the egg to have a \_\_\_\_\_ mass than before it was placed in a solution. Would the solution surrounding the egg be hypertonic or hypotonic compared to the solution (cytoplasm) inside the egg?  
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2. If more water were to move out of the egg than in, you would expect the egg to have a \_\_\_\_\_ mass than before it was placed in a solution. Would the solution surrounding the egg be hypertonic or hypotonic compared to the solution (cytoplasm) inside the egg?  
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### Purpose:

What will happen to eggs when we put them in different concentrations of sugar solutions?

- The sugar that we are using is sucrose. Its molecules are too large to pass through the egg (cell) membrane.
- If sugar can't move across the cell membrane, then what molecule moves across the cell membrane to change the concentration inside or outside of the cell?